

IN THE CLAIMS:

The status of all claims in this reissue application is indicted below. Cancelled original patent claims 2-7 are set forth below in bracketing.

Please CANCEL claim 6 of this REISSUE Application in accordance with the following:

1. (CURRENTLY AMENDED) A band-pass filter having a pair of band-pass filter [input] common signal terminals and plural pairs of band-pass filter [output] signal terminals, comprising:

a pair of [SAW] band-pass filters having respective pass bands and comprising a plurality of [one-port SAW] acoustic wave resonators connected in a multiple ladder structure, each having at least a first stage located at a side of the pair of band-pass filter [input] common signal terminals and [a series-arm resonator located at the first stage,] a pair of input terminals and a pair of output terminals;

the pair of band-pass filter [input] common signal terminals being commonly connected to the [respective pairs of input terminals of the pair] pair of [SAW] band-pass filters;

the plurality of pairs of band-pass filter [output] signal terminals being respectively connected to the [respective pairs of output terminals of the pair] pair of [SAW] band-pass filters; and

an inductance element located between [at least] one of the [SAW] band-pass filters located at the first stage and [the pair of band-pass filter input] one of the common signal terminals. [terminals and directly connected between the respective pair of input terminals of the at least one of the SAW filters and thereby in parallel to said at least one of the SAW filters.]

[2. A SAW filter comprising:

a plurality of first SAW resonators, each having a pair of terminals and a predetermined resonance frequency (f_{rp}), said first SAW resonators being connected in respective, parallel arms of the SAW filter;

a plurality of second SAW resonators, each having a pair of terminals and a predetermined resonance frequency (f_{rs}) approximately equal to an antiresonance frequency (f_{ap}) of each of the first SAW resonators, said

second SAW resonators being provided in series arms of the SAW filter; and inductance elements respectively connected in series with the first SAW resonators in the parallel arms and formed of wires.]

[3. The SAW filter as claimed in claim 2, further comprising:
a package accommodating the first and second resonators and the inductance elements; and lead terminals extending from interiorly of the package to exteriorly thereof,
said wires of the inductance elements being bonded to said lead terminals.]

[4. A band-pass filter having a predetermined pass-band characteristic and comprising:
a plurality of SAW resonators connected in a ladder formation, said plurality of resonators being connected in respective serial arms and parallel arms; and bonding inductance elements, said parallel arms of said ladder formation being connected to ground via respective said bonding inductance elements.]

[5. The band-pass filter as claimed in claim 4, wherein said bonding inductance elements comprise wires.]

[6. A band-pass filter having a pair of band-pass filter input terminals and plural pairs of band-pass filter output terminals, comprising:

a pair of SAW filters having respective, different pass bands and each SAW filter having a pair of SAW filter input terminals and a pair of SAW filter output terminals and comprising a plurality of one-port SAW resonators connected in a ladder structure between the input and output terminals and including at least a first stage having a series-arm SAW resonator connected to one of the pair of input terminals;

a pair of SAW filters having respective pass bands and comprising a plurality of one-port SAW resonators connected in a ladder structure, each having at least a first stage located at a side of the pair of band-pass filter input terminals and a series-arm resonator located at the first stage, a pair of input terminals and a pair of output terminals;

the pair of band-pass filter input terminals being commonly connected to the respective pairs of input terminals of the pair of SAW filters;

the plurality of pairs of band-pass filter output terminals being connected to the respective pairs of output terminals of the pair of SAW filters.

[7. A band-pass filter having a predetermined pass-band characteristic and comprising:

a plurality of SAW resonators connected in a ladder configuration of respective serial arms and parallel arms, said plurality of SAW resonators being connected in respective said serial arms and parallel arms; and
bonding inductance elements respectively connecting said parallel arms of said ladder configuration to ground.]

8-21 (CANCELLED)

22. (CURRENTLY AMENDED) An acoustic wave filter comprising:

a first acoustic wave resonator having a pair of terminals and a predetermined resonance frequency (frp), said first acoustic wave resonator being provided in a parallel arm of the acoustic wave filter on a LiTaO₃ substrate; and

a second acoustic wave resonator having a pair of terminals and a predetermined resonance frequency (frs) approximately equal to a predetermined antiresonance frequency of the first acoustic wave resonator (fap), said second acoustic wave resonator being provided in a series arm of the acoustic wave filter on the LiTaO₃ substrate; and

an inductance element connected in series with the first acoustic wave resonator in the parallel arm, the inductance element functioning to increase the admittance of the parallel arm and decrease the resonance frequency, wherein

the first acoustic wave resonator comprises an exciting interdigital electrode and first and second reflectors, each of which comprises either aluminum or an aluminum alloy containing a few weight percentage of metal, other than aluminum; and

the respective film thicknesses of the exciting interdigital electrode and the first and second reflectors are in a range of from 0.06 to 0.09 times the period of the exciting interdigital electrode.

23. (CURRENTLY AMENDED) An acoustic wave filter comprising:

a first acoustic wave resonator having a pair of terminals and a predetermined resonance frequency (frp), said first acoustic wave resonator being provided in a parallel arm of the acoustic wave filter on a LiTaO₃ substrate; and

a second acoustic wave resonator having a pair of terminals and a predetermined resonance frequency (frs) approximately equal to a predetermined antiresonance frequency of the first acoustic wave resonator (fap), said second acoustic wave resonator being provided in a series arm of the acoustic wave filter on the LiTaO₃ substrate; and

an inductance element connected in series with the first acoustic wave resonator in the parallel arm, the inductance element functioning to increase the admittance of the parallel arm and decrease the resonance frequency, wherein

the first acoustic wave resonator comprises an exciting interdigital electrode and first and second reflectors, each of which comprises either gold or a gold alloy containing a few weight percentage of metal other than gold; and the respective film thicknesses of the exciting interdigital electrode and the first and second reflectors are in a range of from 0.0086 to 0.013 times the period of the exciting interdigital electrode.

24. (CURRENTLY AMENDED) An acoustic wave filter comprising:
a plurality of first acoustic wave resonators on a single piezoelectric substrate, each having a pair of terminals and a predetermined resonance frequency (frp), said first acoustic wave resonators being connected in respective, parallel arms of the acoustic wave filter;
a plurality of second acoustic wave resonators on the piezoelectric substrate, each having a pair of terminals and a predetermined resonance frequency (frs) approximately equal to the predetermined antiresonance frequency of the first acoustic wave resonator (fap), said second acoustic wave resonators being provided in a series arm of the acoustic wave filter; and
inductance elements respectively connected in series with the first acoustic wave resonators in the parallel arms.

25. (CURRENTLY AMENDED) A band-pass filter having a pair of band-pass filter common signal terminals and plural pairs of band-pass filter signal terminals, comprising:
a first band-pass filter having a pass band, having a band center frequency and comprising a plurality of acoustic wave resonators connected in a multiple ladder structure, having at least a first stage located at a side of the pair of band-pass filter common signal terminals, a pair of input terminals and a pair of output terminals;
a second band-pass filter having a different pass band from the pass band of the first band-pass filter, having a band center frequency which is larger than the band center frequency of the first band-pass filter and comprising a plurality of acoustic wave resonators connected in a multiple ladder structure, having at least a first stage located at a side of the pair of band-pass filter common signal terminals, a pair of input terminals and a pair of output terminals;
the pair of band-pass filter common signal terminals being commonly connected to the first and second band-pass filters;
the plurality of pairs of band-pass filter signal terminals being respectively connected to

the first and second band-pass filters; and

an impedance matching circuit located only between the first stage of the second band-pass filter and the common signal terminals.

26. (PREVIOUSLY PRESENTED) The band-pass filter as claimed in claim 25, wherein the impedance matching circuit includes an inductor.

27. (PREVIOUSLY PRESENTED) The band-pass filter as claimed in claim 26, wherein the inductor is formed with a metallic strip line.

28. (PREVIOUSLY PRESENTED) The band-pass filter as claimed in claim 27, wherein the metallic strip line is formed on a ceramic package.

29. (CURRENTLY AMENDED) The band-pass filter as claimed in claim 25, wherein said impedance matching circuit includes an inductor and a capacitor.

30. (CURRENTLY AMENDED) A band-pass filter comprising:
a first band-pass filter having a pass band, having a band center frequency and comprising a plurality of acoustic wave resonators connected in a multiple ladder structure, having at least a first stage and a series-arm resonator located at the first stage, a pair of input terminals and a pair of output terminals;

a second band-pass filter having a different pass band from the pass band of the first band-pass filter, having a band center frequency which is larger than the band center frequency of the first band-pass filter and comprising a plurality of acoustic wave resonators connected in a multiple ladder structure, having at least a first stage and a parallel-arm resonator located at the first stage, a pair of input terminals and a pair of output terminals;

a pair of band-pass filter common signal terminals commonly connected to the first and second band-pass filters;

a plurality of pairs of band-pass filter signal terminals respectively connected to the first and second band-pass filters;

a circuit element used for phase rotation and connected between at least one of the pair of common signal terminals and the second band-pass filter.

31. (PREVIOUSLY PRESENTED) The band-pass filter as claimed in claim 30, wherein

the circuit element comprises a line formed on a glass-epoxy substrate or a ceramic substrate.

32. (CURRENTLY AMENDED) The band-pass filter as claimed in claim 30, wherein the circuit element comprises an inductance element.

33. (CURRENTLY AMENDED) The band-pass filter as claimed in claim 32, wherein the circuit element further comprises a capacitance element coupled to the inductance element.

34. (CANCELLED)

35. (CURRENTLY AMENDED) A band-pass filter having a predetermined pass-band characteristic and comprising:

a plurality of acoustic wave resonators connected in a ladder formation, said plurality of resonators being connected in respective serial arms and parallel arms; and

bonding inductance elements, said parallel arms of said ladder formation being connected to ground via respective said bonding inductance elements, wherein:

a package in which the band-pass filter is mounted, contains a piezoelectric substrate and the ground; and

the plurality of acoustic wave resonators are on the piezoelectric substrate.

36. (CURRENTLY AMENDED) A band-pass filter having a predetermined pass-band characteristic and comprising:

a plurality of acoustic wave resonators connected in a ladder formation, said plurality of resonators being connected in respective serial arms and parallel arms; and

bonding inductance elements, said parallel arms of said ladder formation being connected to ground via respective said bonding inductance elements, wherein:

a package in which the band-pass filter is mounted contains a piezoelectric substrate;

the plurality of acoustic wave resonators are on the piezoelectric substrate; and

a first electric resistance (R_s) of an interdigital electrode of a acoustic wave resonator provided in a series arm, is smaller than a second electric resistance (R_p) of an interdigital electrode of a acoustic wave resonator provided in a parallel arm which is next to the series arm.

37. (CURRENTLY AMENDED) A band-pass filter having a predetermined pass-band characteristic and comprising:

a plurality of acoustic wave resonators connected in a ladder formation, said plurality of resonators being connected in respective serial arms and parallel arms; and

bonding inductance elements, said parallel arms of said ladder formation being connected to ground via respective said bonding inductance elements, wherein:

the plurality of acoustic wave resonators are on a piezoelectric substrate; and

the bonding inductance elements are respectively connected to the ground outside the piezoelectric substrate.